REMARKS

The objections to the drawings have been considered and replacement formal drawings are provided herewith.

Figures 2-5 and 7-13 have been amended to provide proper cross sectional shading. Further, in Figures 1 and 7 the reference characters indicating section lines have been amended to refer to the figure which shows the cross sectional view.

In Figures 6-13, the reference characters 5, 6, 7 and 9 have been relabeled ---51---, ---61---, ---71---, and ---91---. Finally, Figures 6-13 have been labeled as prior art.

Applicant believes the amended formal drawings have addressed the objections and approval thereof is respectfully requested.

The objection to the abstract has been considered. The abstract has been amended extensively and is believed to conform to USPTO practice. Approval is respectfully requested.

The title has been amended as suggested in the Office Action and approval thereof is respectfully requested.

In the Office Action, Claims 1 and 2 are objected to and also rejected under 35 USC §112, second paragraph, as being indefinite. Claims 1 and 2 have been revised extensively and are believed definite. Approval of the claim language is respectfully requested. Applicant notes that the clearance c_1, c_2 is defined as the path of the water receiver from the top of the center sash 4 to the bottom thereof at a location below the belt line BL of the door. Thus Applicant believes the term "clearance" is definite.

The rejection of Claims 1 and 2 under 35 USC §103 as unpatentable over admitted prior art Figures 6-11 provided in Applicant's application in view of Akachi, U.S. Patent No. 5 105 580 has been considered.

Applicant's admitted prior art Figures 6-11 illustrate a center sash 41 located between and receiving glass 2 and glass

3 at opposing sides. Further, the center sash has a die molded portion 71 at a top end and an extrusion molded portion located therebelow. Prior art Figure 9 shows the glass 2, 3 inserted into opposing sides of the sash 41. Figure 10 shows the vehicle door closed so that the weather strip 9 mounted to the roof, contacts the molded part 71. As shown in prior art Figure 11, the force of the weather strip causes clearance C_1 on the interior side of the center sash 4. No water receiver is provided in this embodiment.

Akachi discloses a weather strip for a motor vehicle body for sealing against a door glass of a frameless door when the door is closed. The weather strip 4 is also attached to a center pillar of the vehicle (column 2, lines 30-32 and 53-55). Figure 1 shows the weather strip extending along the pillar and the roof of the door at the top part thereof.

When the frameless door 2 of Akachi is shut, the door glass contacts first and second seal parts S_1 S_2. Water leaking into the concave groove 44 through either of the seal parts S_1, S_2, which are oriented outwardly of the vehicle body flows along an extended concave groove 45 and out the rear side edge of the door at end 451 (Column 2, lines 42-52).

Akachi does not disclose or suggest a glass retaining member that can receive a fixed glass. Instead Akachi discloses a weatherstrip extending about the top and sides of a door opening.

There is no motivation, absent Applicant's specification, to provide the water receiving grooves 44, 45 of Akachi for the prior art embodiment of Figures 6-11 to route water away from the interior of a vehicle. The Akachi weather strip contacts a door glass only when the door is shut. The water receiver of Akachi thus is located on an outer vehicle body side of the weather strip.

Further, admitted prior art Figures 6-11 do not disclose, teach or suggest the use of a water receiver. Thus, there is no motivation, absent Applicant's specification, to choose to

provide the water receiver of Akachi with the structure of prior art Figures 6 and 11.

Further, Applicant's Claim 1 recites a glass-retaining member including a partition to receive a fixed glass and "at an opposing side a glassrun through which a side edge of an elevating glass is passable therealong". This structure is not disclosed or suggested by Akachi, which functions in an entirely different manner and thus is not combinable with prior art Figures 6-11.

Further, Claim 1 recites "an opening" at an upper end of the water receiver being directed toward "a clearance located at the roof side weather strip, the die-molded portion at the upper edge of the glass retaining member, and the upper edge of the glass". This feature is illustrated in Applicant's Figure 1 and Figure 5 whereat the lip pieces 21, 22 form a clearance with the glass at the roof side weather strip 9.

Applicant's claimed glass-retaining member is a separate element from the roof side weather strip as recited in Claim 1, whereas the weather strip disclosed in Akachi comprises the entire weather strip of the vehicle door body. It is unclear how elements of the weatherstrip of Akachi can logically be provided for the center sash of prior art Figures 6-11.

New independent Claim 3 recites that the glass-retaining member comprises "a center sash". Once again, the weather strip disclosed in Akachi is not a center sash and it is unclear why one would look to the weatherstrip arrangement of Akachi to modify the center sash disclosed separately from the weatherstrip in admitted prior art Figures 6-11.

Further, Claim 3 recites "a first lip piece having a first end integral with the inner projection defining the first recess and a second end for contacting a side of the first glass". This feature is illustrated in Applicant's Figure 3 which shows an inner projection contacting the glass and then the lip piece 21, 22 contacting the glass to form a water receiver c_2. This arrangement differs from prior art

Figure 11, which shows a clearance c_1 formed outwardly from an end of the die molded portion of the sash.

In conclusion, there is no motivation, absent Applicant's specification, to selectively provide the water receiver of the weatherstrip arrangement of Akachi that is used against a frameless glass window contacting the weather strip, for the center sash of prior art Figures 6-11, which receives both a first glass and a second glass on opposing sides thereof and is distinct from a separate weather strip located at the vehicle roof top edge.

Further, Claim 3 recites "the first lip piece being spaced a predetermined distance from the upper end of said die-molded taper portion". This is illustrated in Applicant's Figure 1, as viewed from the interior of the vehicle. This spacing or gap is not believed present in Akachi. Further, no lip pieces 21, 22 are disclosed in prior art Figures 6-11, much less the spacing of the lip pieces from the upper end of the die-molded tapered portion.

For the reasons set forth above Claims 1-3 are believed allowable over the applied prior art.

Claims 4-9 have been added. Claim 4 is independent and recites a sealing structure combined with a vehicle door including a center sash and lip pieces. Admitted prior art Figures 6-11, do not include lip pieces and Akachi only describes a weatherstrip that is not a center sash. Therefore, Claim 4 and Claims 5-9 dependent therefrom, are believed allowable.

In view of the foregoing discussion, Claims 1-9 are believed to be patentably distinguishable from the applied prior art and therefore, are believed in condition for allowance.

Further and favorable consideration of this application is respectfully solicited.

Respectfully submitted,

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Encl: Marked-up Substitute Specification
Clean Substitute Specification
Marked-up Abstract
Drawings
Postal Card

136.05/04

Marked-up Substitute Specification
U.S. Serial No. 10/695 136

SEALING STRUCTURE INCLUDING A WATER RECEIVER ~~OF~~ FOR AN AUTOMOBILE

Field of the Invention

The present invention relates to a sealing structure ~~of~~for an automobile~~, in~~. In particular a sealing structure that is capable of treating water invading between glass retaining members which partition door glass in a hardtop vehicle, etc., and an open-top vehicle, etc., (hereinafter merely called a "hardtop vehicle, etc.,")~~, ,for~~. For example, ~~as shown in~~ Fig. 6, ~~between the~~shows a center sash 41 partitioning off triangular glass 2 of the front door 1 and the front glass 3, and a weatherstrip attached to a roof-side and resiliently brought into contact with the upper edge of the triangular glass 2 and the front glass 3.

BACKGROUND OF THE INVENTION

~~In a hardtop vehicle, etc., there~~There are some types of vehicles in which the door glass of a window is composed of a plurality of glasses, one of which is a fixed type and the other of which is elevated for closing and lowered for opening. In such a ~~hardtop~~ vehicle, ~~etc., a~~ partition to receive ~~attached to~~ the side edge of a fixed glass and a glassrun to receive ~~through which~~ a side edge of elevating glass ~~is passed~~ are mounted at ~~the~~a center sash which operates as a glass retaining member ~~partitioning~~that partitions the respective glasses of a door.

A~~, and a~~ weatherstrip is resiliently brought into contact with the upper edge of the respective glasses and is attached to the roofside.

Fig. 7 through Fig. 10 show one example of the above-described sealing structure~~, wherein~~. Fig. 7 shows an enlarged view of portion "~~a~~7A" of the center sash 4 shown in Fig. 6~~,~~. Fig. 8 is a view taken along the line ~~D-D~~8-8 in Fig. 7~~,~~ and Fig. 9 is a view taken along the line ~~E-E~~9-9 in the same drawing.

The center sash 4 is made of metal or resin, and its section is roughly I-shaped as shown in Fig. 9. A partition ~~5~~51 and a glassrun ~~6~~61 are mounted in attaching recesses 4a and 4b at both sides of the center sash ~~4~~41, respectively. The partition ~~5~~51 is attached to the side edge of a triangular glass 2, and the side edge of an elevating front glass 3 is inserted into the glassrun ~~6~~61.

Also, the center sash ~~4~~41 has a resin-made die-molded portion ~~7~~71, whose tip end is made thin, integrally formed on the upper end thereof, and the partition ~~5~~51 is attached to the side edge of a triangular glass 2~~, and at~~. At the same time, the side edge of the elevated front glass 3 is inserted into the other side ~~thereof~~in the glassrun 61.

In addition, with respect to triangular marks shown in Fig. 7, the solid black portions ~~thereof show~~delimit a die-molded ~~portions~~portion thereabove.~~, and~~ The whiteout portions ~~thereof show~~indicate that an extrusion-molded ~~portions~~portion is located therebelow. ~~This~~The arrangement is the same in the ~~following~~other drawings.

Fig. 10 shows roofside weatherstrip ~~9~~91 attached to the

open-edge portion of a door of a vehicle~~, etc.,~~ body ~~in a hardtop vehicle, etc.,~~. The weatherstrip ~~9~~91 is composed of an attaching base portion 13 mounted at a holder 12 attached to a body panel 11~~, a~~. A hollow sealing portion 14 is integrally molded with the corresponding attaching base portion 13, and a lip 15 is resiliently brought into contact with the body panel 11 and ~~covering up~~covers a retainer 12. When the door 1 is closed, the upper edge of the triangular glass, the tip end portion of the die-molded portion and the upper edge of the elevated front glass are brought into contact with a sealing portion 14, wherein sealing is brought about. ~~The drawing~~Fig. 10 shows a state where the tip end portion of the die-molded portion is brought into contact with the sealing portion 14. In ~~the drawing~~Fig. 10, a lacing braid 16 is shown, which is provided integrally with the holder 12 and is brought into contact with the body panel 11.

The die-molded portion ~~7~~71 at the upper end of the above-described center sash is made thin at the tip end portion as shown in Fig. 13. Nevertheless, the thickness of the die-molded portion ~~7~~71 at its tip end portion is thicker than the thickness of the triangular glass 2 and front glass 3 as shown in Fig. 8, and is step-formed. Therefore, when the front door 1 is closed, as shown in Fig. 11, clearance c_1 is provided between the hollow sealing portion 14 of the roofside weatherstrip ~~9~~91 and the triangular glass 2 or front glass 3, wherein water invades the clearance c_1.

In order to solve the problem, ~~in the prior arts,~~ some countermeasures have been employed in the prior art, one of

which has been to eliminate a gap between the sealing portion 14 and the triangular glass 2 or front glass 3 by making the tip end portion of the die-molded portion remarkably thin~~, and the other of which~~. Another countermeasure is to increase the adhesiveness of the tip end portion of the die-molded portion and sealing portion 14 by inserting a pad in the hollow sealing portion 14 when the door is closed.

Further, as shown in Fig. 12 and Fig. 13, another ~~type~~countermeasure was proposed, in which the roofside weatherstrip is formed by using a mold at the point at which the die-molded portion 7 of the upper end of the center sash is made to contact, a water receiver 18 is integrally formed at the die-molded portion 9a and receives water invading from the above-described clearance c_1, and water is discharged through a water draining port 19.

However, the respective countermeasures described above are not sufficient as countermeasures for treating water invading from clearance c_1. Further, as shown in Fig. 12 and Fig. 13, in the method for providing the water receiver 18, the appearance of the water receiver is not satisfactory when the door is opened~~, and since~~. Since the point at which the die-molded portion ~~7~~71 is made to contact at the upper end of the center sash is formed by using a mold, the number of processes in manufacturing a roofside weatherstrip ~~9~~91 is increased, thereby resulting in an increase in production costs.

It is therefore an object of the present invention to provide a sealing structure for a ~~hardtop~~ vehicle, ~~(etc.,)~~ for which a countermeasure for treating water invading from the

above-described clearance c_1 is employed.

SUMMARY OF THE INVENTION

In a ~~hardtop~~ vehicle~~, (etc.,)~~ which is the target of the present invention, a glass-retaining member such as, for example, a center sash 4 shown in Fig. 6, which partitions a door glass, is provided at a door. A partition attached to the side edge of the fixed glass and/or a glassrun through which the side edge of the elevating glass is passed are mounted at both sides of the glass-retaining member, and a die-molded portion whose tip end is made thin is integrally formed at the upper edge thereof. On the other hand, a roof side weatherstrip which carries out sealing is provided at the roofside~~, and the~~. The upper edge of the glass and the die-molded portion at the upper edge of the above-described glass-retaining member are resiliently brought into contact with the roofside ~~wetherstrip~~weatherstrip. A water receiver which goes along the glass-retaining member is continuously formed integrally at the above-described die-molded portion, the above-described partition and/or glassrun, and the opening at the upper end of the water receiver is directed to the clearance c_1 among or by the roofside weatherstrip, the die-molded portion at the upper edge of the above-described glass-retaining member, and the upper edge of the door glass when the door is closed~~, and the~~. The lower end of the water receiver is opened in the door panel which is lower than the belt line.

According to the present invention, water invading from the

above-described clearance passes through the water receiver and is caused to flow down in the door panel which is lower than the belt line, wherein invaded water can be securely discharged, and no water is accumulated in the water receiver. Therefore, it is not necessary to make the water receiver large so that accumulated water does not overflow. In addition, the partition and glassrun are usually extrusion-molded, and the water receiver can be simultaneously molded by extrusion molding. Also, in the case of molding, the water receiver can be integrally formed, wherein there is no need to additionally prepare a die molding process in order to mold the water receiver.

According to ~~Another~~another invention, a weatherstrip has a lip piece, in which a water receiver is integrally formed with the partition and/or glassrun, and whose tip end is resiliently brought into contact with the door glass with clearance remaining between the same and glass.

According to the invention, since a part of the water receiver is composed of a door glass, the water receiver can be downsized, and can be further miniaturized, and sealing performance of the die-molded portion, partition and/or glassrun can be further improved.

Other features and effects of the present invention will be more clearly understood in the following detailed description of the embodiment by those skilled in the art. It must be, however, noted that the technical scope of the present invention is not limited to the embodiment and the accompanying drawings alone.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front elevational view showing an upper end portion of the center sash according to the invention, which is observed from the interior side of a vehicle~~, etc.~~;

Fig. 2 is a sectional view taken along the line ~~A-A~~2-2 in Fig. 1;

Fig. 3 is a sectional view taken along the line ~~B-B~~3-3 in ~~the same drawing~~Fig. 1;

Fig. 4 is a sectional view taken along the line ~~C-C~~4-4 in ~~the same drawing~~Fig. 1;

Fig. 5 is a side elevational view of the upper end portion of the center sash shown in Fig. 1;

Fig. 6 is a front elevational view of a door for a ~~hardtop~~ vehicle~~, etc.,~~;

Fig. 7 is a front elevational view showing an upper end portion of ~~the~~a prior art center sash ~~according to the prior arts, which is observed~~viewed from the exterior side of a vehicle~~, etc.,~~;

Fig. 8 is a sectional view taken along the line ~~D-D~~8-8 in Fig. 7;

Fig. 9 is a sectional view taken along the line ~~E-E~~9-9 in Fig. 7;

Fig. 10 is a sectional view of a roofside weatherstrip to which a die-molded portion at the upper end portion of the center sash is pressed by closing the door;

Fig. 11 is a view showing a state where clearance c_1 is formed between a roofside weatherstrip and triangular glass and/or front glass;

Fig. 12 is a front elevational view showing the die-molded

portion of a weatherstrip to which the die-molded portion is fitted; and

Fig. 13 is a ~~longitudinally~~longitudinal sectional view showing the die-molded portion of a weatherstrip to which the die-molded portion is fitted.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Hereinafter, a description is given of a sealing structure according to one embodiment of the present invention with reference to Fig. 1 through Fig. 5. In the drawings, parts that are the same as those in Fig. 7 through Fig. 9 are given the same reference ~~numbers~~numerals.

~~Fig. 1 is a view showing the upper end portion of the center sash 4 according to the invention, which is observed from the interior side of a vehicle, etc.,, Fig. 2 is a sectional view taken along the line A-A in Fig. 1, Fig. 3 is a sectional view taken along the line B-B in the same drawing, Fig. 4 is a sectional view taken along the line C-C in the same drawing, and~~ Fig. 5 ~~is a view showing~~shows the side of the center sash 4 which operates as a glass-retaining member for retaining glass. Lip pieces 23 and 24 ~~whose~~have tip ends that are resiliently brought into contact with a triangular glass 2 and a front glass 3~~ are~~. The lip pieces 23, 24 are integrally formed at the interior side of a vehicle~~, etc.,~~ body at a partition 5 and glassrun 6 along the center sash 4 with clearance remaining between the same and the triangular glass 2 and front glass 3 which compose a door glass. The lower ends ~~thereof~~of the lip

pieces 23, 24 extend into the door ~~which~~to a location that is lower than the belt line BL of the front door 1 shown in Fig. 6.

At the die-molded portion 7 at the upper edge of the center sash 4, lip pieces 21 and 22 that compose a water receiver along with the above-described lip pieces 23 and 24 are continuously formed integrally with the lip pieces 23 and 24 of the partition 5 and glassrun 6 at the left and right sides at the interior side of the vehicle~~, etc.,~~ body. ~~And the~~The upper ends ~~thereof~~of the lip pieces 23, 24 are positioned below the roofside weatherstrip 9, as shown in Fig. 5, when the door is closed, and ~~is~~are composed so as to surround the clearance c_1, shown in Fig. 11, which is produced ~~among~~by the differential gap ~~of~~formed by the die-molded portion 7, triangular glass 2 and front glass 3, and the roofside weatherstrip 9.

With the sealing structure according to the present embodiment, water that invades through the clearance c_1 shown in Fig. 11 passes through clearance c_2 (Fig. 3) between the lip pieces 21 and 22, which compose a water receiver, and the triangular glass 2 and front glass 3, and clearance c_2 (Fig. 4) between the lip pieces 23 and 24 and the triangular glass 2 and front glass 3, and is discharged into the door.

The above-described embodiment shows an example in which the partition 5 and glassrun 6 are provided at both sides of the center sash 4. However, in another embodiment, only the partition 5 may be provided at both sides of the center sash or only the glassrun 6 may be provided ~~there~~thereon.

In the above-described embodiment, an example in which the sealing structure is applied to a hardtop vehicle~~, etc.,~~ is

shown. However, the sealing structure may be applicable to the center sash of an open-top vehicle~~, etc.,~~ as well.

In addition, in the above-described embodiment, although the glass and the partition are separately prepared, the glass and partition may be integrally formed.

Marked-up Replacement Abstract
U.S. Serial No. 10/695 136

Abstract

In a hardtop vehicle~~, etc., in which~~ a partition and a glassrun are mounted at both sides of a center sash~~-4 which partitions at~~. The partition can receive a triangular glass of a front door and the glassrun can receive a front glass~~, a~~. The center sash has a die-molded portion~~-7 whose~~ with a thin tip end~~-is made thin is integrally formed~~ at ~~the~~an upper edge thereof~~, and a~~. A roofside weatherstrip~~-9~~ is provided~~-at the roofside, a~~. The center sash has a water receiver composed of lip pieces ~~21, 22, 23 and 24 is~~-formed in the ~~direction toward~~vehicle interior side of the center sash~~-4 integrally with the die-molded portion 7, partition and glassrun and is resiliently brought into contact with the triangular glass and front glass with clearance remaining. The water receiver is composed so that an~~. An opening at the upper end ~~thereof~~of the water receiver is positioned below the roofside weatherstrip~~-9~~ when a door is closed~~, and the~~. The water receiver ~~surrounds clearance which is formed among a differential gap of~~provides a clearance extending the length of the die-molded portion of the center sash and ~~7 and the glass and the roofside weatherstrip 9. and the lower end thereof extends~~-into the door below the belt line~~, wherein~~ so that water discharges~~-invading from the above-described clearance is discharged into the door~~ below the belt line ~~through the water receiver~~.